

REMARKS

In response to the Office Action mailed September 4, 2003, claim 40 have been amended and no claim has been cancelled or added. Accordingly, claims 10-13, 40 and 42-46 are now active in this application, of which claims 10 and 40 are independent.

Entry of the Amendments and Remarks is respectfully requested because entry of Amendment places the present application in condition for allowance, or in the alternative, better form for appeal. No new matters are believed to be added by these Amendments. Based on the above Amendments and the following Remarks, Applicant respectfully requests that the Examiner reconsider the outstanding rejections and they be withdrawn.

Rejections Under 35 U.S.C. §103

In the Office Action, claims 10-13, 40 and 42-44 have been rejected under 35 U.S.C. §103(a) for being unpatentable over U. S. Patent Publication No. 2002/0061410 A1 to Sasaki, *et al.* ("Sasaki") in view of U. S. Patent No. 5,478,766 issued to Park, *et al.* ("Park"). This rejection is respectfully traversed.

Independent claim 10 recites:

10. A contact structure of a wire, comprising:
a wire including a conductive material made of an *aluminum-based material*;
an inorganic insulating layer covering the wire and having a contact hole exposing the wire; and
a conductive layer made of *indium zinc oxide*, formed on the insulating layer and contacting the wire through the contact hole.

As recited in claim 10, the present invention is directed to a wire including an *aluminum-based* conductive material, and a conductive layer made of IZO.

In the Office Action, the Examiner asserted that the primary reference to Sasaki discloses all the claimed features except for the material of the insulation film. Particularly, the Examiner stated that, in FIG. 5 of Sasaki, the gate wire [3] (“5” appears to be a mistake) corresponds to the claimed “a wire including a conductive material made of an aluminum-based material”. This assertion is respectfully disagreed with.

Sasaki explicitly discloses “a gate electrode 3 ... made of a *copper* thin film” and “A source electrode 7 and drain electrode 8 comprising a *copper* thin film” (Page 2, Paragraph [0028]). Thus, it should be clear that Sasaki does not disclose a wire including an aluminum-based conductive material, as claimed.

Rather, Sasaki denounces using aluminum in a contact structure. Sasaki further describes:

“However, when ITO is used to as the transparent conductive layer of electronic equipment, and aluminum is used as the wiring metal, direct contact between ITO and aluminum causes oxidation of aluminum by oxygen contained in ITO, thereby *causing the problem of increasing the electric resistance value of the contact portion*” (Page 1, Paragraph [0009])

Thus, Sasaki in fact *denounces* using aluminum in a contact structure when being used with ITO. To solve this problem, Sasaki discloses using “a wiring layer made of copper” (Page 1, Paragraph [0011], which “causes no increase in electric resistance value of a contact portion even in contact with a transparent conductive layer of ITO or the like” (Page 1, Paragraph [0010]).

Accordingly, it is submitted that Sasaki not only fails to teach that the gate wire 3, lower pad 17, source and drain electrodes 7 and 8 are formed of an aluminum-based conductive material, but also clearly *teaches away* from using an aluminum-based conductive material in the gate wire 3, lower pad 17, source and drain electrodes 7 and 8.

In fact, Park discloses “a metal layer is deposited ..., thereby forming a source electrode 6 and a drain electrode 7” (Column 1, Lines 61-63) and “the source electrode, the drain electrode and the data line are composed of aluminum ...” (Column 3, Lines 29-31). However, Park further mentions:

“the source electrode, the drain electrode and the data line are composed of aluminum which is chemically reacted with ITO”
Therefore, due to the chemical corrosion of aluminum and ITO, a wiring defect can occur” (Column 3, Lines 29-32).

As such, Park also denounces use of aluminum and ITO in a contact structure. Since both of the cited references teach away from using an aluminum-based conductive material in a contact structure with an ITO layer, it is submitted that there is no motivation from any of the cited references to modify the structure of Sasaki such that the gate wire or data wire is replaced with an aluminum-based conductive material. Thus, it is submitted that claim 10 is patentable from Sasaki and Park. Claims 11-13 that are dependent from claim 10 would be also patentable at least for the same reason.

Independent claim 40 recites “the first conductive layer and the second conductive layer includes metal containing an aluminum-based material”. As previously mentioned, both references teach away from using an aluminum-based material in a contact with an ITO layer”. Thus, there is no motivation for modifying the structure shown in Sasaki such that the copper gate wire and data wire are replaced with aluminum-based wires. Thus, it is submitted that claim 40 is patentable at least for the same reason. Claims 42-44 that are dependent from claim 40 would be also patentable at least for the same reason.

Accordingly, Applicant respectfully requests that the rejection over claims 10-14, 40 and 42-44 be withdrawn.

In the Office Action, claims 45 and 46 have been rejected under 35 U.S.C. §103(a) for being unpatentable over Sasaki in view of Park, and further in view of U. S. Patent No. 6,072,450 issued to Yamada, et al. (“Yamada”). This rejection is respectfully traversed.

Claims 45 and 46 are dependent from claim 40. As previously mentioned, claim 40 is believed to be patentable over Sasaki and Park. Particularly, there is no motivation from either Sasaki or Park to modify the structure shown in FIG. 1 of Sasaki such that the copper gate wire 3 and 17 is replaced with an aluminum-based conductive material.

Yamada is directed to an organic EL device. However, Yamada fails to cure the deficiency from Sasaki and Park. Particularly, Yamada does not explicitly or implicitly provide any reason to invalidate the explicit denouncement from Sasaki and Park that an aluminum-based conductive layer cannot be used for a wire layer in a contact with ITO.

For this reason, it is submitted that claim 40 is still patentable over Sasaki, Park and Yamada. Thus, Claims 45 and 46 that are dependent from claim 40 would be patentable at least for the same reason. Accordingly, Applicant respectfully requests that the rejection over claims 45 and 46 be withdrawn.

Other Matters

In this response, claim 40 has been amended for clarification that both gate wire and data wire are formed of an aluminum-based conductive material, as shown in FIG. 2 of the present application.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicant believes that a full and complete response has been made to the outstanding Office Action and, as such, claims 10-13, 40 and 42-46 are in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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